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8 September 1983

## USSR REPORT

## ENERGY

No. 158

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pp 1-7 to correct certain translation terms.

## OIL AND GAS

### MINISTER SURVEYS GAS INDUSTRY

Moscow GAZOVAYA PROMYSHLENNOST' in Russian No 1, Jan 83 pp 2-6

[Article by V. A. Dinkov, minister, USSR Gas Industry: "Strengthen the Fuel and Energy Base of the National Economy"]

[Excerpts] Putting into life the historic decisions of the CPSU 26th Congress, the Soviet people, under the leadership of the Communist Party and its Leninist Central Committee successfully brought 1982 to an end. In the years of the five-year plan which have elapsed great successes have been attained in implementing the party's long term socio-economic policy directed towards a general improvement in working people's living standards on the basis of growth in public production and its increased efficiency.

As a result of the widespread application of progressive equipment and processes, the USSR Unified Gas Supply System, the world's largest, has been created. It includes 260 gas and petroleum deposits, dozens of gas storage facilities, and a total of 143,000 kilometers of main gas pipelines. Gas now accounts for 27 percent of the nation's fuel balance, and by 1985 this will grow to 33 percent.

The gas industry has been transformed into one of the key sectors in the fuel and energy complex, having a significant influence upon the productivity growth of social labor and the acceleration of technical progress throughout the entire socialist economy.

The CPSU 26th Congress presented the gas industry new problems which are even greater and more critical. They are clearly defined in the "Basic Directions for the Economic and Social Development of the USSR during 1981-1985 and for the Period up to 1990."

The current five-year plan calls for the accelerated increase in gas production, bringing it up to 630 billion cubic meters by 1985, and for increases in petroleum and condensate production.

It will be necessary to solve a number of large problems in geological exploration work, drill through more than 10 million meters of rock, and complete about 4,000 oil and gas wells.

About 65 new deposits will be put into industrial exploitation, including the Sovetabadskiye in Turkmenistan and the Karachaganakskoye in Kazakhstan. A gas

and chemical complex based on the Astrakhan deposit must be built within a shortened time frame. The capacity of the Mubarek gas complex will double, and sulfur, helium and ethane production will grow. During a five year period industrial output volume will increase 40 percent, and labor productivity will grow 26 percent.

During the 11th Five-Year Plan it is intended to begin developing oil and gas deposits on Black and Caspian Sea shelves and on the island of Sakhalin.

Over a five year period there are provisions to lay about 44,000 kilometers of main and distribution gas pipelines with 334 compressor stations. These pipelines include 5 Urengoy - Center lines and the Urengoy-Uzhgorod line with a diameter of 1,420 millimeters.

The central problems in the successful realization of the five-year plan for the development of the gas industry are those of ensuring the accelerated and comprehensive opening of deposits in northern Tyuman Oblast and the implementation of an extensive program of gas pipeline construction to deliver Siberian gas to the nation's central and western regions.

Practically the entire growth in gas production during the current five-year plan will take place through the development of West Siberian deposits. Production at the Tyumengazprom Association should grow 2.3 fold.

The state plan for the economic and social development of the gas industry during 1981 and 1982 was completed in full accordance with the strategy worked out by the 26th Party Congress. In 2 years the national economy was delivered 15 billion cubic meters of gas above the plan. The growth in industrial output was 112.4 percent, while the plan figure was 111 percent, for labor productivity the respective figures were 109 and 108.2 percent. There were savings in production outlays and above plan profits exceed 200 million rubles.

Thus, in evaluating work results for the sector as a whole, one could say that good results have been attained over a two year period. However, our indicators could have been significantly greater if it had not been for the effect of a number of factors seriously complicating the sector's development.

In recent years there have been changes in the geographic distribution of reserves of gas and its useful components. While in 1975 the Ukraine, the northern Caucasus, and the Komi ASSR accounted for about 40 percent of total national gas extraction, in 1980 this had declined to 19 percent, and by 1985 it will drop to 10 percent. Nevertheless, capacity is being developed here, cadre personnel trained, and well planned housing settlements built.

In practically all regions there is a steady growth in the share of new capacity, compensating for deposits which are declining due to the depletion of reserves.

The shift in the center of gas extraction to West Siberia, accompanied by the continuation of increases in consumption in the nation's European section makes it necessary to lay very long main pipelines in extreme natural and climatic conditions and leads to increased capital investments in gas transportation.

There is a sharp increase in the labor and capital intensity of drilling operations due to the development of deep sulfur and condensate bearing reserves in the Volga area, Central Asia, the sea shelves and gas condensate deposits in complex geological conditions in the permafrost of West Siberia. The cost of 1 meter of exploratory and production drilling increased 45 percent during the 10th Five-Year Plan. Capital investments in the growth of new capacity increased from 13.4 to 16 rubles per 1,000 cubic meters of gas.

As a result of these objective factors' influence the growth rates of capital investment and fixed capital outstripped production growth rates..

Gas transportation in main pipelines requires serious work in the improvement of the methodology for determining the optimal variant for loading individual lines and branches in the Unified System, and raising the hydraulic efficiency of gas lines. It is also essential to carry out additional work to improve gas cleaning at fields, and to remove liquids from gas pipelines, especially ones newly put into operation.

Compressor units consume large amounts of gas, oil, and electrical energy. The capacity of main pipelines depends upon their operational stability. One of the indicators of operations is running time between breakdowns. However, in many associations this indicator is considerably below the sector average.

The ministry is giving constant attention to the conservation of materials, fuel and energy resources and raw materials. Association collectives have developed and are implementing specific measures. There have been All Union reviews of the efficiency of material and fuel-energy resource utilization. In addition to definite successes, we also have many shortcomings and unutilized possibilities.

A number of associations and enterprises, such as Kasp mashzavody, the Votkinskiy, Baku, and Kokand gas equipment plants and others are not meeting plan norms for the consumption of fuel and materials.

The cases of excessive gas consumption indicate that the managers of main administrations, associations, and scientific organizations are only very slowly reorganizing their work in accordance with the fuel and energy resource conservation measures which have been posed. Some enterprises have not created an atmosphere of impatience towards cases of unproductive consumption of gas. There is weak control over technical conditions and repair and preventive maintenance on lines, gas pumping equipment, and metering instruments.

Additional measures should be taken to bring order to the study and development of progressive norms ensuring the conservation of fuel and energy resources, and to see that these norms are applied to all parties involved in decision making. We should have effective methodologies for stimulating the conservation of material resources.

Enterprises have considerable reserves for using gas condensate resources.



Contemporary requirements are not met by the level of scientific research and development in the creation of more efficient processes for increasing the degree of gas condensate removal and the coefficient of condensate extraction. Insufficient attention is being given to the introduction of progressive systems for the collection and transportation of condensate.

The ministry has examined this problem and issued a special order which provides for the construction and operational introduction during 1982-1985 of the capacity necessary for increasing condensate extraction; the improvement of technological conditions of well operation; and the development and introduction of progressive technical solutions and the comprehensive automation of condensate recovery.

An equally important problem involves increasing operating capacity and improving its technical-economic indicators through reconstruction and technical modernization. At present the relative share of reconstruction and technical modernization does not exceed 1-1.4 percent of the funds being used. Capital repair resources are used for projects such as the modernization and replacement of obsolete and physically worn out gas pumping equipment, dust collectors, air coolers for oil, water, and gas at compressor stations, energy using equipment and machinery; for the construction and reequipping of starting units and piston intakes, the replacement of cranes on the line, and other items. This diverts resources from capital repair and creates major supply difficulties. The CPSU Central Committee and USSR Council of Ministers Decree: "On the Improvement of Planning and the Intensification of the Economic Mechanism's Effect upon Increasing Production Efficiency and Work Quality" opens great possibilities for the creation of suitable conditions for the reconstruction and modernization of existing enterprises. It gives production association managers broad rights in financing and the ratification of design and estimation documentation and in material-technical supply. Together with USSR Gosplan and USSR Gosstroy [State Construction Committee] we have already agreed upon a list of reconstruction and modernization projects. These rights must be fully exercised.

The West Siberian gas industry has a leading role in the nation's fuel and energy complex. By the end of the five-year plan almost 60 percent of the nation's gas will be obtained here and this region will, in essence, determine the entire economy of the gas sector. In order to ensure the planned growth in the extraction of gas and condensate from petroleum at the Tyumengazprom Association, it is necessary to carry out an extensive program of well drilling and completion, the comprehensive outfitting of the Urengoy deposit, and the construction of six large pipelines leading from it.

One should note the unsatisfactory solution to many problems in this region's development, first of all in the construction of industrial infrastructure.

Lagging in the construction of hard surfaced roads, railroads, river moorages and ports, the lack of intrafield and pipeline access roads, and a complex transportation system for delivering materials and equipment, leading to the loss of much valuable freight, all are having a negative influence on the rates and economics of the sector's development. The West Siberian energy base is being created very slowly.

The preparation of wells and capacity for gas extraction at the Urengoy field is lagging sharply. Drilling operations have deteriorated, footage and commercial speed plans are unfulfilled, and there are large amounts of unproductive time.

At the Tyumengazprom Association there are still low levels of economic and organizational work, a neglect of technology, and cases of inefficiency and a careless attitude towards material, labor, and financial resources.

The association persists with serious shortcomings in the use and storage of materials. There is a considerable amount of poorly supplied equipment at construction projects. There is no control over the unloading and loading of equipment and materials, and poor accounting of the receipt and consumption of materials.

The first task of the Tyumen gas workers, and the ministry's central apparatus and entire collective is to raise the efficiency of our work in West Siberia, keeping in mind that in the immediate future Tyumengazprom's economy will decisively determine economic conditions for the entire gas industry.

In recent years we have begun serious work on the continental shelf. Enterprises developing shelf oil and gas resources are conducting extensive work to increase oil and gas extraction from under the sea. Geophysical exploration work volume has increased and its quality improved. A lot of work is being done on the Caspian Sea, where work has begun on development wells drilled from semisubmersible drilling platforms at depths of more than 150 meters. At the field imeni 28 April construction has been completed and drilling operations begun at a stationary platform in 110 meters of water. Other projects are under way. The development of offshore gas resources is a complicated and expensive operation, requiring extensive material and financial resources.

We should promptly build drilling bases to ensure the continuous supply of drilling platforms working at sea, and to completely eliminate their idle time. Without this it is impossible to effectively develop offshore fields.

The acceleration of scientific and technical progress and the widespread introduction of its achievements are decisive directions for improving our sector's work efficiency. The 11th Five-Year Plan makes provisions for radical changes involving the installation of new GPA [Gas Main Units], and wide use will be made of 16 and 25 Mwt and GTK-10 units equipped with full pressure boosters.

In 1983 construction began on gas pipelines at a pressure of 10 MPa. In order to support this construction, pipe production is being organized at the Vyksunskiy metallurgical plant and process equipment production at Minkhimmash [Ministry of Chemical and Petroleum Machine Building]. It is planned to introduce equipment for cooling gas down to ground temperature on gas pipelines passing through regions of unstable permafrost. The field processing of gas, primarily at automated block-module installations for the comprehensive preparation of gas and the stabilization of condensate, with productivities up to 10 million cubic meters daily, is the basis for the transition to the installation of UKPG [Installations for the comprehensive preparation of gas] with a capacity of 20 billion cubic meters annually.

The beginning of gas condensate field development in the Lower Volga, Kazakhstan, and Central Asia, where there are high levels of corrosive components makes it necessary to produce gusher reinforcements for underground equipment up to pressures of 70 MPa, block equipped process lines and installations for condensate stabilization with productivity up to 5 million cubic meters daily and which are corrosion resistant.

In order to increase condensate extraction from reservoirs it is intended to widely introduce secondary recovery methods using high pressure compressors.

Extensive work has been done to technically reequip the sector. Concurrently, however, there are delays in meeting targets. Construction is lagging at an experimental-production facility at Tolyatti for testing experimental models of dust collectors, filter-separators, and air coolers. Documentation has not been worked out for the production of joints with anticorrosion coating.

There is also serious lagging in the solution of a number of very important problems in the construction of 10 MPa main gas pipelines. Construction is still not completed on an experimental section of a pipeline made from multilayer and spiral seam pipe two layer pipe over a 4.5 kilometer stretch at the Novokazym-skaya compressor station. There have been intolerable delays in the construction of an experimental-commercial compressor station with GTN-25 units at Gryazovets, and a facility in Novgorod for testing GTN-25 at 10 MPa.

The Ministry of the Gas Industry is conducting a sizable amount of work in the comprehensive automation and tele-automation of facilities, and in the introduction of ASU [Automated management systems] and computer technology.

During the 11th Five-Year Plan provisions were made for the development and introduction of 25 new and the expansion of 7 existing ASU for technological processes at the most important facilities for gas extraction, transportation, and processing. In particular, by 1985 the following should be put into operation: ASUs for the Urengoygazdobykh [Urengoy Gas Extraction] Association (including automated systems for working fields, control of operations, installations for the comprehensive processing of gas, for essential compressor stations, and for processing condensate); and for the Tyumentransgaz [Tyumen Gas Transportation] Association.

ASUs and computer technology have become effective tools for improving the efficiency of work at units of the central apparatus and associations. However, there are a number of shortcomings in this important area, substantially reducing the efficiency of ASU in the sector. Not all association managers are giving the required attention to the introduction and use of ASU and computer technology. There are delays in creating specialized units and in supplying facilities with hardware systems.

The Soyuzgazavtomatika VNPO [All Union Scientific Production Association for Gas Automation] is not fully performing its functions of designer supervision over the operation of ASU. Some association ASU often develop algorithms and programs for management tasks without coordinating them with Soyuzgazavtomatika VNPO, or change and remove tasks approved by departmental commissions, leading to unjustified difficulties in design and introduction.

The sector ASU lacks a unified data base and interconnections between subsystems. Standardized design solutions have been introduced at practically no gas extraction associations.

In the immediate future Soyuzgazavtomatika VNPO must make a careful analysis of the development state of ASU and compile, for all Mingazprom organizations, a unified plan of work for optimization problems and program packages for ASU for the period up to 1985; it must activate the operations of main and regional computer centers and jointly with association managers take effective measures to put all operating ASUs up to planned performance, ensure their effective utilization and the economic return called for by design indicators.

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## OIL AND GAS

### MAIN WAYS OF IMPROVING INVESTMENT EFFICIENCY OUTLINED

Moscow GAZOVAYA PROMYSHLENNOST' in Russian No 1, Jan 83 pp 10-12

[Article by A. N. Kolotilin, deputy minister, USSR Gas Industry: "Sectoral Reserves for Improving the Efficiency of Capital Investments"]

[Excerpts] The main feature of the 11th Five-Year Plan program for capital construction is that it envisages a sizable increase in the operational introduction of fixed capital in face of a reduced growth in capital investment.

This places special importance upon ensuring the maximum concentration of labor, materials, and finance upon priority projects in order to rapidly put them into operation.

The huge scales of construction and the sector's high capital intensity require the effective utilization of allocated resources, and a radical improvement in capital construction.

In 1981-1982 Mingazprom [Ministry of the Gas Industry] and Minneftegazstroy [Ministry of Construction of Petroleum and Gas Industry Enterprises] took a number of measures directed toward the accelerated construction of gas industry projects. Schedules were promptly worked out for the construction of facilities on the Urengoy - Petrovsk and Urengoy - Novopskov gas pipelines, and measures approved for the construction of compressor stations on the Urengoy - Petrovsk pipeline.

Thanks to these measures, last March a 2,730 km section of the Urengoy - Petrovsk pipeline was completed and put into operation, and the Novokazym'skaya, Ivdel'skaya, Sergiyevskaya, and Sharanskaya compressor stations were put into operation within reduced time frames.

Putting the line part of the Urengoy - Petrovsk pipeline into operation ahead of time frees labor and material-engineering resources for use on the construction of the Urengoy - Uzhgorod line.

Ministry planning institutes and associations have completed work on planning and estimation documentation, the allotment of land, and the issuance of timber felling permits to build the Urengoy - Uzhgorod line. Organizations from related ministries have begun preparatory work on compressor stations for the line.

The results of capital construction program fulfillment in the sector are evidence of sizable reserves: the plan for the use of capital investments and the introduction of fixed capital was not fulfilled, and there is lagging in the construction of compressor stations, UKPG, and projects for nonproduction needs.

Planning institutes and clients must accelerate the time frames for designing projects, and make provisions for pace setting rates for priority projects. Associations must make a detailed analysis of the composition of uncompleted construction and take measures to complete projects and formalizing their operational introduction.

Balance in plan targets for the operational introduction of capacity and fixed capital with limits on capital investments and construction-installation work supplied with material-technical resources is a decisive factor in the efficient use of resources provided for capital construction.

The 1983 draft plan for the Mingazprom limited capital investments to 14.3 percent over the 1982 level.

In order to reduce the construction time of new projects, the plan provides for the increased concentration of capital investments on the most important projects. Thus, 66 percent of capital investments are concentrated on the construction of the Urengoy - Uzhgorod (Line I), the Urengoy - Petrovsk, the Urengoy - Novopskov, the Urengoy - Center (Line I) and on fitting out the Urengoy field during 1983.

The concentration of capital investments on priority projects has permitted the 1983 draft plan to increase the introduction of fixed capital by 2.9 billion rubles compared to the five-year plan. The volume of uncompleted construction at the end of the current year should not exceed 64 percent of capital investments (the norm is 74 percent).

Substantial reserves for effective capital investments exist in planning and design.

The ministry's planning and scientific research institutes have done much to reduce the time needed for the design and introduction of new technology and progressive technical solutions for projects. These include:

The development and approval of standardized plans for unitized-block compressor stations with various types of large capacity assemblies, permitting about an 8 percent reduction in construction-installation work and a 12-15 percent reduction in labor costs at construction projects, while the coefficient of density for the system was increased to 42-45 percent;

Standardized design solutions for the connections of all types of assemblies, making it possible to centrally manufacture (in plant conditions) assemblies and intermediate units;

Used the advantages of the new GTN-25, GTN-16, GPA-Ts-16, and STD-12500 units, located them at the zero datum, used full pressure two stage boosters, and a high degree of unitization and automation.

The work done on the standardization of compressor station design should ensure a 236 million ruble reduction in construction installation work and a 7 million person day reduction in labor outlays during 1983-1985.

Within compressed time frames institutes successfully handled the planning and design of such unique installations and the Urengoy - Petrovsk, Urengoy - Novopskov, Urengoy - Pomary - Uzhgorod, Urengoy - Center, and other pipelines.

In recent years optimal planning methods based on computer technology and mathematical economics have been developed at ministry planning and design organizations. The widespread introduction of these methods at all planning institutes considerably improves the efficiency of capital investments in the sector.

The construction of six pipelines in a single corridor is very important in reducing planning time and accelerating construction. This construction method reduces the amount of survey and design work and compressor station cost because of the fewer auxiliary operation facilities and temporary structures.

The results of consultants studies of many projects are evidence that the reserves for reducing estimated construction costs are far from exhausted. Thus, the total estimated cost of projects studied in 1981 by the Consultants Administration was reduced by 11 percent through the use of improved specification of work volumes, the calculation of potential for using capacity, and the search for more efficient solutions.

The transportation system for hauling pipes, equipment, and materials has a substantial influence on estimated construction cost. During the planning process the most rational system for freight transportation should be selected, with consideration given to transportation potentials in the construction region.

In recent years the estimated construction cost of 1 kilometer of main pipeline has risen approximately 20-25 percent and construction installation work has increased by 15-17 percent. This is due to the difficult weather and natural conditions in the regions where the lines are laid, increases in the costs of building infrastructure projects, and additional outlays caused by increased requirements for environmental protection, and for energy supply system construction's share in roads, bridges, etc.

In spite of the tendency for main pipeline construction costs to increase, there are definite reserves which can stabilize this growth, reduce estimated costs, and improve capital investment efficiency.

Among these one could include:

Provide for unified hydraulic conditions in parallel pipelines, reducing looping and permitting the more effective utilization of installed capacity at line compressor stations;

Lay equal passage junctions across water barriers and reduce reserve lines;

A stricter approach to determining pipelines' category of participation in the right of way.

Strengthen compressor station interconnections through the use of full pressure boosters;

Build improved units which are completely finished at the plant;

Organize the centralized repair of compressor station equipment;

Universally introduce standardized designs for block-unitized main pipeline compressor stations, approved by USSR Gostroy;

Establish territorial restrictions on block-boxes and block-unitized installations.

Establish cost limits for infrastructure (relative share) projects in estimated costs for the projects;

Implement measures to limit the cost of installations included in the estimate for industrial construction demanded by other ministries, departments, and local organs;

More extensively involve ministries, departments, and local organs in the shared participation in the construction of projects for external energy supply, communications, transportation, treatment facilities, etc.

The following can also substantially reduce the estimated cost of construction projects: The use of pipe with improved physical-mechanical properties, facilitating the construction of structures from high strength and light concrete and steel with improved strength; the optimal arrangement of general plans for projects with minimal fire control and sanitary distances between buildings and installations, the non-conduit laying of utility lines; the more rational use of resources for temporary buildings and installations, including the widespread introduction of prepackaged buildings for repeated use.

It is also essential to introduce order into the preliminary approval of transportation systems for delivering freight and large objects.

The implementation of these measures for improving the efficiency of capital investments and using existing reserves will reduce estimated costs for projects during the 11th Five-Year Plan by at least 5 percent, reduce unit capital investments for gas extraction and limit their rise for gas transportation.

One of the main directions for improving capital construction efficiency of above ground projects in the gas industry is the use of the unitized block method, the further improvement of parametric series and the standardization of existing blocks and block boxes for main and auxiliary functions. This will sharply reduce labor outlays at project sites, and accelerate the construction and introduction of compressor stations, field and other facilities.

However, there are a number of unsolved problems in the unitized block method reducing its efficiency. In a number of cases above ground facilities built by the unitized block method are more costly than traditionally built ones, and do not adequately meet contemporary requirements for the economic use of metals.



Block boxes for the same purpose often use different process flow systems and different equipment.

The solution of these problems will help improve the economic efficiency of block unitized installations in the construction of compressor stations and field facilities.

The time required for planning and reviewing projects, and for building and putting them into operation can only be reduced if association-clients, planning institutes, and contracting organizations will work in close contact.

The client and builder have a very wide range of functions, covering the development of plans, the timely supply of contracting organizations with high quality technical documentation, equipment and materials. These and other functions performed by the client to a great extent determine the introduction times for gas industry fixed capital.

Association-clients have a huge role in reducing construction estimated costs and improving its efficiency. Prior to the presentation of plans to the ministry for expert review and approval they should give more attention to evaluating technical and economic indicators.

There are also very large reserves for the improvement of the sector's management structure for capital construction.

An Administration for the Construction of Gas Extraction and Transportation Enterprises (Sibtsestr), 29 directorates for gas pipeline construction, and 64 directorate departments have been created and are functioning in the Mingazprom system.

The administration's functions are conducted through a 5 element and 3 element system in Tyumengazprom, a 4 element system in Ukgazprom, Glavyugtransgaz, Glavtsentrtransgaz, and Glavvostoktransgaz, and a 3 element system in Orenburggazprom, Soyuzuzbekgazprom, Turkmengazprom, and Armentransgaz.

In order to improve the gas industry construction project management system, a Central Directorate has been created at the ministry. It has entrusted with the function of title holder (general client) for the construction of the Urengoy - Pomary - Uzhgorod (I and II) and the Urengoy - Center (I and II) lines.

The creation of a Central Directorate will ensure that very important projects are promptly supplied with planning and estimation documentation, equipment, and materials.

To bring order into relations between organizations participating in gas industry project planning and construction, the ministry has done a great deal to prepare for publication the "Handbook of Statutes and Instructions for Capital Construction in the Sector".

This handbook contains statutes and instructions on the entire complex of problems involved in the planning of capital investments and design work:

The relationship between client and contractor in concluding contracts, supplying projects with equipment, cleaning and testing pipe, accepting completed production capacity and projects by working and state acceptance commissions, etc.

The handbook makes it possible to improve the technical training of workers participating in the construction of gas industry projects, and enhances the responsibility of ministry officials on the site for the prompt operational introduction of capacity and projects, as well as for the more operational solution of all problems arising in construction projects.

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pp 14-17 to change certain translation terms.

## OIL AND GAS

### DRILLING OPERATIONS IMPROVEMENTS OUTLINED

Moscow GAZOVAYA PROMYSHLENNOST' in Russian No 1, Jan 83 pp 26-27

[Article by L. P. Chertkov, deputy chief, Gas and Gas Condensate Well Drilling Administration, Mingazprom: "Improve Efficiency in the Construction of Gas and Gas Condensate Wells"]

[Text] The growth in Mingazprom's gas extraction planned for the 11th Five Year Plan can be attained only through a sizable increase in the number of completed wells in the most promising regions. Therefore during 1981-1985 it is planned to accelerate the increase in drilling footage. In Tyumen Oblast the amount of drilling for gas, gas condensate and oil will increase 3.5 fold by 1985 compared to 1981. Producing well footage at the Orenburggazprom VPO will increase 2.6 fold, and at the Turkmengazprom VPO 2.1 fold.

In Tyumen Oblast the Ukaburgaz and Kuban'morneftegaz Associations will use the watch - expedition method to do a sizable amount of drilling in the Valanzhinskiye deposits at well depths of 3,000 meters. The Orenburggazprom VPO plans to increase footage and have deeper wells under more difficult well completion conditions. While prior to 1981 drilling here was primarily at depths less than 1,800 meters, now, even during the current five-year plan a sizable amount of drilling will be at depths down to 4,100 meters at the Karachaganakskoye field and 4,500 meters at the Astrakhan field under conditions of hydrogen sulfide corrosion and in the presence of salts and AVPD [abnormally high formation pressure]. There will be a similar increase in drilling in Turkmenia, with volume increase continuing in conditions of greater depths, and more complex well drilling conditions.

In spite of these difficulties it is planned to increase the volume of producing well drilling in Tyumen Oblast and Turkmenistan and increase commercial speeds. Thus, at the Senomanskiye deposits commercial speeds should increase from 1,650 to 2,000 meters per rig per month, at the Valanzhinskiye deposits from 900 to 1,400, and in Turkmenistan it is planned to increase commercial speeds from 440 to 490 meters per rig per month.

These footages and commercial speeds can be attained only if a sizable amount of work is done to outfit drilling sites in each region. For example, the planned 2.5 fold increase in drilling in Tyumen Oblast requires the construction and introduction of new bases for servicing and new technical facilities.

In order to ensure the effective work of drilling brigades, Mingazprom is taking serious measures to strengthen drilling enterprises in the region. In Tyumen a production association for drilling (PO Tyumenburgaz) has been created. It includes facilities for servicing all drilling enterprises in the region: a central pipe base, a base for the material-technical supply administration, a central base for production services, a base for rig assembly and a plugging and cementing base, a motor vehicle and tractor enterprise base, and others.

Contractor drilling organizations of the Ukgazprom and Kuban'morneftegazprom Associations are successfully building pioneer bases at the Urengoy field and planning their expansion as their drilling work increases.

In order to discover and study problems complicating well completion in the West Siberian region, Mingazprom has created a special commission which includes the managers of associations and scientific research institutes (NII) organizing drilling work in Tyumen Oblast. It has worked out detailed and specific measures for improving the quality of well completion and operation in permafrost.

Jointly with sector NII, Tyumengazprom drillers have practically solved the problem of filtering drilling muds during work at the Senomanskiye and Valanzhinskiye deposits. Good results have been obtained in cementing the entire casing and ensuring well reliability. Great results are expected from the conversion to well drilling with electric drives. In view of the delays in equipping fields with high voltage transmission lines and step-down substations, during the first stage the Tyumenburgaz PO used PAES-2500 type autonomous electric generators burning natural gas for its drilling needs. This made it possible to drill 37 percent of the footage in 1981 with electric drive rigs. Drilling commercial speed with electric drive is 231 meters per rig per month more than for diesel drive rigs, and the cost per meter was reduced by 14 rubles.

An analysis of organizational and technical conditions of well completion in Tyumen, Turkmenistan, Orenburg, and other regions shows the similarity of problems linked to the necessity of constructing drilling enterprises in new regions, solving problems of material-technical supply, organizational, and technical plans.

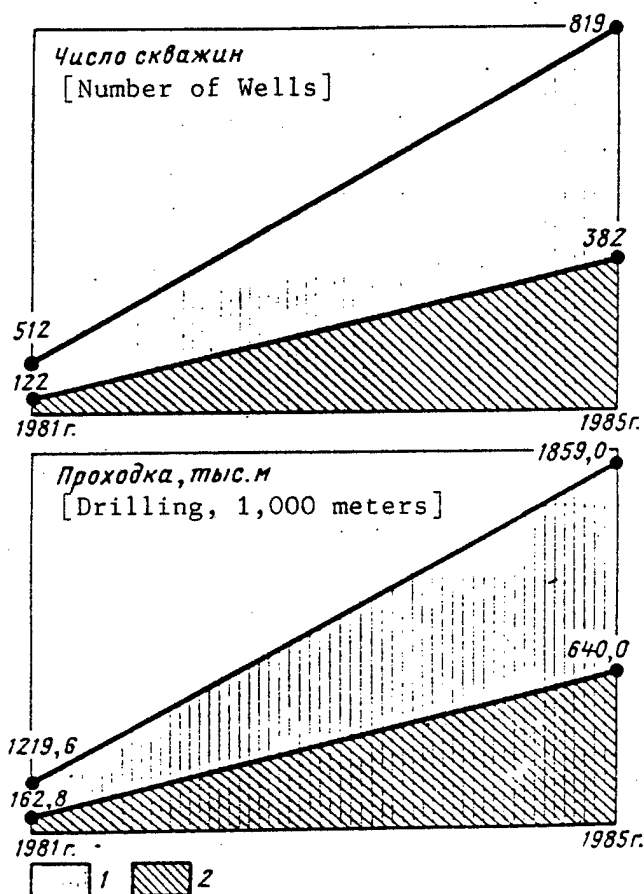
Mingazprom has outlined ways of modernizing and improving work organization in the completion of gas and condensate wells by associations in the sector, and has ratified measures to improve the efficiency of drilling operations and reduce the accident rate. Intersectoral programs have been developed to supplement these sectoral measures. Thus, jointly with Minkhimmash [Ministry of Chemical and Petroleum Machine Building] we have developed a program for the technical improvement of existing equipment and the organization of the production of new types meeting contemporary requirements.

The sector's drilling enterprises are increasing the amount of drilling using new highly efficient types of bits and downhole motors that are produced by the domestic industry, and also licensed bits. It is planned to increase drilling with new types of bits to 704,200 meters. Good results have also been obtained from the use of chemical reagents such as KMTs-700. There are increased

deliveries of tightly sealed and high strength casing pipe, light alloy drilling pipe, high torque spindle turbodrills and other new design drilling engines. There is a considerable increase in the use of flaw detection equipment on drilling tools.

The sector is giving great attention to problems of well testing. Thus, during the five-year plan the use of pipe reservoir testing to determine reservoir parameters in sampling development wells will increase to 335 well operations.

The improvement of drilling mud filtering and the control over the working-off of drill tools has a substantial influence upon reducing the accident rate and improving bit operation indicators. Sector plants have organized the production of a double vibrating screen for filtering drilling muds and of spare parts for drill equipment. Drilling enterprises have increased repairs and inspections of new bits arriving from industry and bits in use.



Growth Dynamics of Producer Well Drilling in the 11th Five-Year Plan (1981 - Actual; 1985 - Planned)

1 - Total for Mingazprom; 2 - Including West Siberia

An analysis shows that the creation of efficient process equipment (bits with a service life of 100 hours and more, drilling rigs with universal installation capabilities, high strength casing and drilling pipe) is planned only for the end of the 11th or in the subsequent five-year plan. Because of this it is necessary to plan the increases in commercial speed using existing equipment standards and levels.

The problems of increasing commercial speed facing Mingazprom can be solved through two independent directions for increasing labor productivity in drilling:

The introduction of new or optimal technical solutions with existing equipment;

Improvements in the organization of labor and production management in well completion.

The improvement of technical-economic indicators of well drilling and completion resulting from the introduction of new or optimal technical solutions is made possible through drilling exploratory-technological (oporno-tekhnologicheskoye) wells and making use of this experience in drilling subsequent wells.

As far as improvements in drilling technology are concerned, a special role should be held by developments directed towards reducing accident rates, i.e. increasing commercial speeds, and consequently towards reducing the costs of drilling operations. Improvements in labor and management organization are another way of increasing commercial speeds.

In recent years SevkavNIIgaz [North Caucasus Scientific Research Institute for Gas] has developed a complex of methodologies and instruction for improving the structure and methods of drilling operation enterprises, improving planning and the organization of control over well completion work at the UBR [Drilling operation administration] level, for a system of material-technical supply, the use of progressive forms of paying labor, and methods for the synchronous organization of work at all structural subdivisions of drilling enterprises.

In order to improve drilling operation efficiency Mingazprom is planning to solve problems of information support for well completion by building, in each region, computer centers equipped with third generation computers.

The analysis of work in the preceding years has revealed and has resulted in the use of reserves. This made it possible to increase the 1981 level of commercial speed for producer well drilling 21.7 percent over the 1980 figure, while development drilling speed increased 19.5 percent.

The results obtained are not limiting figures, and in spite of growing difficulties in well completion can and will be improved.

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## OIL AND GAS

### WORK ON GAS SERVICES FOR LATVIAN RURAL AREAS PROGRESSES

Riga SOVETSKAYA LATVIYA in Russian 2 Mar 83 p 1

[Interview with Yu. A. Smirnov, first deputy chairman of the Latvian SSR State Committee for Gas Services, by Ya. Mushin, occasion, date, and place not specified]

[Text] Our republic is one of the leaders in the country for level of gas services to rural regions. Infrared burners, radiators, and heaters in cattle and hog barns, grain drying units, hothouses, and poultry units raise the productivity of livestock, improve their maintenance during the fall and winter, and help raise early vegetables and mechanize labor-intensive processes. Natural gas has become a reliable helper in agricultural production. More and more kolkhozes and sovkhoses are being connected in to the trunk gas pipelines from Pskov to Riga, from Vilnius to Riga, and from Iyetsava to Liyepaya.

Here is what Yu. A. Smirnov, first deputy chairman of the Latvian SSR State Committee for Gas Services, said in a conversation with Latinform correspondent Ya. Mushin.

[Answer] Following the resolutions of the 26th CPSU Congress on improving the structure of the fuel-energy balance by reducing the share of petroleum and petroleum products in the national economy and replacing them with natural gas, a program of measures has been envisioned in the republic and is being steadily carried forward in practice. This year one more rayon center of the republic, Tsisis, will be connected to the trunk pipeline from Valday through Pskov to Riga. It will be the seventh Latvian city to receive natural gas.

Because the existing gas distribution station in Yelgava has not supplied the needs of industrial and other sites, a second plant was built there late last year which will make it possible to provide full gas services to the right-bank part of the city. In the future natural gas will also be supplied to the Dzirnietki and Lielupe sovkhoses and the Rosme and Stal'gane kolkhozes in this region.

In the current five-year plan a trunk gas pipeline is to be built from Riga to Daugavpils. The cities of Ogre, Stuchka, Plyavinyas, Yekabpils, Livanya, and Daugavpils will be connected to it.

[Question] How fast is work going to provide gas services to kolkhozes and sovkhoses?

[Answer] It could have been more intensive. To a significant degree this depends on capital investment appropriated by the farms and on the capacities of the contracting organizations. The republic Ministry of Agriculture is appropriating 2.5 million rubles for gas hookups in the current five-year plan.

The Latgiprosel'stroy [possibly Latvian SSR State Planning and Design Institute for Rural Construction] Institute is working out plans for gas hookups in a number of major regions and for more than 30 sovkhoses and kolkhozes. These plans envision lines from the trunk line to the rayon centers and to the kolkhozes and sovkhoses. Gas supply plans are now being developed for Ogrskiy, Stuchkinskiy, Yekabpilsskiy, Preyl'skiy, and Daugavpilsskiy rayons.

[Question] How many farms are receiving natural gas from existing trunk line systems today?

[Answer] Natural gas for production purposes is being delivered to 24 kolkhozes and sovkhoses, and 96 farms use liquefied gas. Plans for this year envision constructing several more gas distribution stations, which will make it possible to increase the number of farms that use gas. I might observe that during the entire 10th Five-Year Plan only three gas distribution stations for rural needs were built.

[Question] Usually a cluster of kolkhozes and sovkhoses, not just one farm, is connected in to gas pipelines. The gas system services have been set up on co-operative principles. What kind of organizations are they?

[Answer] Yes, a number of rayons in the republic have such services. Experience has demonstrated the effectiveness of working together to operate gas service facilities, and also the efficiency of cooperation in laying gas pipelines. For example, the Nakotne Kolkhoz in Yelgavskiy Rayon has formed such a service together with the Shkibe Sovkhoz and the Zelta Druva Kolkhoz in neighboring Dobel'skiy Rayon. This enables them to solve the problems of using natural gas efficiently on mutually advantageous principles and to operate the equipment in a technically correct manner. The gas service at these farms is managed by experienced engineer Yuris Lasis. We already have quite a number of such specialists. Cooperation among farms in providing gas services reduces labor and material expenditures for these purposes. Everyone benefits from this. Outstanding gas service has been organized at the Dzirkstele Kolkhoz in Tukumskiy Rayon, the Kekava and Marupe Kolkhozes in Rihskiy Rayon, and other farms.

Because there are more and more rural facilities using gas each year, we are helping train skilled specialists for the countryside. In 1982, taking into account the experience of the leading farms, a methodological guide on providing gas service to agricultural sites was developed. It includes all questions of design, a list of recommended standard gas equipment, procedures for training workers, development of operating documents, and much more. Ultimately all these steps have a positive effect on the economic activity of the kolkhozes and sovkhoses. They help increase the production of milk, meat, and vegetables.



Experience has shown that expenditures for connecting economic units to gas services are repaid in 1.5-2 years.

[Question] How is natural gas being used for the domestic needs of rural inhabitants?

[Answer] Ranges have been installed in almost 220,000 rural apartments. The plan of gas services for domestic needs in 1982 was overfulfilled. Gas hookups were provided to 2,000 apartments beyond the plan. By the end of the five-year plan, more than 230,000 families in rural areas will be able to use gas.

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## OIL AND GAS

### SREDAZNIIGAZ DIRECTOR COMPLAINS OF LACK OF SUPPORT

Tashkent PRAVDA VOSTOKA in Russian 6 Apr 83 p 3

[Article by U. Mamadzhanov, director of the Central Asian Scientific Research Institute of Natural Gas, doctor of technical sciences: "The Sources of Natural Gas"]

[Text] The republic gas industry appeared slightly more than 20 years ago. In this comparatively short time it has become a powerful economic sector.

Such rapid growth involves solving a number of complex scientific problems and fundamental technical and economic questions. It was necessary to set up a major scientific research institution. So, in 1959, the decision was made to open branches of the All-Union Scientific Research Institute of Gas and the Fuel Institute in Tashkent. They were later merged into a single complex, the natural gas institute Sredazniigaz [Central Asian Scientific Research Institute of Natural Gas].

But what are the principal areas of work of one of the largest scientific research institutions in Central Asia?

One of the most labor-intensive production processes in gas extraction is well drilling. In our region it must be done under very complex conditions. Anomalous high pressures, aggressive salt beds, and highly toxic gas make this process much more complicated. Our leading specialists -- candidate of chemical sciences T. V. Khasanov, head of the drilling laboratory L. A. Abramovich, and senior scientific associate V. S. Yekshibarov -- find optimal solutions in every concrete situation and help field workers steadily increase the drilling rate.

But to design and then develop gas deposits is not the ultimate goal of our scientists and specialists. Development must be scientifically substantiated. We are constantly calculating more optimal and efficient alternatives, pursuing the purpose of maximizing gas extraction from underground. The laboratory headed by R. M. Miklin, winner of the Turkmen SSR State Prize, takes care of this work.

But now suppose the field is ready for exploitation. Now the natural gas must be delivered to the customer who lives many thousands of kilometers from the source. And here the questions of preparing refined gas, the technology of moving it significant distances, and the operation of gas pipeline systems arise in all their complexity.

It is common knowledge that enormous amounts of money are spent building gas pipelines. When they are operated, therefore, it is extremely important to learn how to predict the optimal parameters of the gas transfer system, taking into account seasonal differences in gas consumption. Specialists at the institute make these calculations for the Central Asian region. Their introduction in the gas pipeline systems from Bukhara to the Urals and Central Asia to the Center insured a technical-economic effect equal to one percent of the prime cost of gas transportation. This is several million rubles of savings!

Our institute has solved other problems also. Industrial and municipal and domestic service enterprises receive gas through pipes that have limited carrying capacity. This results in a situation where large industrial centers experience an acute shortage of fuel at certain times, especially during the winter; the gas pipeline cannot supply gas beyond the norm. The resulting acute shortage must be covered by other types of fuel or by spending significant capital to build additional pipelines, compressor stations, etc.

But there is another, more reliable way. These are underground gas storage facilities near large industrial centers. They accumulate gas during the period of reduced load and deliver it during the period of peak consumption; in other words, they help regulate the seasonal irregularity in demand. Two underground storage facilities have already been built according to proposals and designs by specialists at the institute and are operating successfully. Future plans envision building new ones.

Introduction of new methods of obtaining high-grade drilling mud occupies a special place among the scientific-technical development projects of our scientists. It is difficult to overestimate its importance in gas extraction. Composition and stability of the mud determine the quality of the well and cost of its construction. The phenomenon of electroactivation of liquid media, discovered by a group of scientists and specialists at the institute, is a fundamentally new direction in regulating the quality of drilling muds. Special activator units which at present are not found in any other country have been developed, tested, and introduced in production on the basis of this discovery. It has been calculated that introduction of the fundamentally new drilling technology will enable geologists and gas and oil workers in Uzbekistan alone to save more than 5 million rubles each year. Electroactivators, which are produced in small series at the Kokand Bol'shevik Machine Plant, are being used successfully today not only at deposits in Central Asia, but also in the Ukraine.

Experience has shown that the use of the new technology for electrical treatment of drilling mud at gas deposits makes it possible to sharply reduce the use of expensive chemicals, guarantees high-quality mud, and thus prevents downtime and accidents in drilling sites.

The electroactivators were tested at the oilfields of the All-Union Soyuzuzbekgazprom [USSR-Uzbek Gas Industry] Industrial Association, the All-Union Turkmengazprom [Turkmen Gas Industry] Production Association, the All-Union Kasporneftegazprom [Caspian Offshore Petroleum-Gas Industry] Production Association, the Uzbekneft' [Uzbek Petroleum] Production Association and the Uzbek SSR Ministry of Geology and have shown favorable results. For example,

under offshore conditions their use makes it possible to completely eliminate the use of caustic soda and reduce the consumption of expensive stabilizing agents by 30-40 percent. The use of electroactivators in desert regions of Turkmenistan demonstrated the possibility of saving 100-120 kilograms of starch, 180-700 kilograms of barite, 25-27 kilograms of sodium chloride, 15-17 kilograms of caustic soda, and other chemicals for each meter of well excavation.

But despite the great impact that has been established, not all aspects of the technology have been fully worked out. Moreover, the service life of the activators is still quite short. Scientists and specialists at the institute will have to work hard to refine the electrical drilling technology and build fundamentally new, reliable activators with a longer service life.

We have discovered a number of potential reserves by thoroughly analyzing work in recent years. Above all we have tried to improve the planning of scientific work. We have firmly rejected the established practice where each laboratory put forward its own subjects for scientific research and "imposed" them on production associations. At the present time the topics of scientific research and experimental design projects are determined by the learned council of the institute and the scientific-technical councils of the all-Union industrial associations, which consider their significance and the feasibility of doing and introducing them at the established times. Only after this is a topic area ratified by the higher-ranking body and the level of financing determined.

The collective has been working on a cost accounting basis for three years now. The new method has revealed a number of positive aspects and made it possible to accelerate the introduction of scientific developments into production. It has invigorated activity at the institute. At the same time, the new system of economic management is not fully understood by certain subdivision managers who are carried away with present-day subjects and do not lay an appropriate foundation to solve the composite problems of the future. At the present time the learned council of the institute is successfully developing optimal medium-range plans both for the entire collective and for each subdivision.

The collective of the institute performs a number of important assignments together with the head scientific research institutions of the sectors. In the 11th Five-year Plan, we are responsible for such comprehensive scientific-technical programs as writing a general plan for development of the Uzbek gas industry and developing and introducing electrochemical technology for removing hydrogen sulfide and carbon dioxide from gas and combatting corrosion. In order to successfully resolve all these issues it is necessary first to strengthen and expand the production base of the institute. We cannot do without a substantial experimental base and a testing plant.

It should be noted that the necessary capital for this has been released, but the contractor, Construction Trust No 8 of Glavtashkentstroy [Tashkent Main Administration for Construction] is incorporating it very slowly and some sites which have been started are practically frozen. I think that given the acute shortage of natural gas, construction workers will understand the full significance of gas for the national economy and correct the situation.

## OIL AND GAS

### TURKMENNEFT' FAULTED FOR SLOW PACE OF WORK

Ashkhabad TURKMENSKAYA ISKRA in Russian 22 Jan 83 p 2

[Article by N. Shirdzhanov, laboratory head at the TurkmenNIPIneft' Institute, candidate of sciences: "How To "Wake Up" the Stratum?"]

[Text] The level of petroleum extraction in the republic has gradually declined in the last 10 years. In connection with this the problem of how to increase the vitality of the strata has become critical. It is a burning issue, one which demands an immediate solution.

We know that petroleum strata are temperamental -- they give up only a sixth or a seventh of their "black gold" voluntarily. This means that we cannot rely on the free flow, and therefore mechanization must replace the strata's own energy. But even the mechanized method of extraction enables us to get only 20-25 percent of the contents of the stratum. With the existing technology the rest of the oil remains in the ground, which is absolutely intolerable. The critical question on the agenda is efficient and complete exploitation of underground wealth.

Scientists and production workers are making considerable efforts in this direction. Several methods are now being tried on an experimental industrial scale. The first of them is forcing the oil out with water. It is true that this promising technological procedure is still not as powerful as we would like. Even when a stratum is flooded at least half of the oil remains in it. How about the method of thermal treatment to increase the energy of the stratum? Yes, our calculations show that it is promising, especially if wet burning is created in the stratum by pumping hot water and steam. Plans call for testing this innovation at the old Kum-Dag deposits.

For any petroleum-gas extraction administration in the republic thermal gas-chemical treatment of producing wells is simpler and more accessible. It may be noted that this made it possible to receive an additional 55,000 tons of previously inaccessible oil.

One other innovation has been developed through the joint efforts of TurkmenNIPIneft' [Turkmen Scientific Research and Planning Institute of Petroleum] and SevkavNIPIneft' [Northern Caucasus Scientific Research and Planning Institute of Petroleum]. We are referring to pumping gas under high pressure into the

strata of the Burun deposit. The efficiency of wells can be increased significantly in this way. This is especially important if we consider that during the last 10 years exploitation of the deposit and its yield were just three percent. If extraction were to continue at such a rate it would take hundreds of years, even though we are speaking of a much smaller scale than the Tyumen fields. Therefore scientists suggested the first step toward intensification of petroleum extraction at Burun and other deep strata.

But in order to pump gas at high pressure we need up-to-date, heavy duty compressors that develop 350 atmospheres. There are no such compressors. For the sake of fairness I will note that work is being conducted on new compressors, but it is going very slowly. The primary organization at fault for this is the Turkmenneft' [Turkmen Petroleum] Association.

The main trouble is that the institute does not have technical experimental facilities, even though they have been under discussion at different levels for many years. There was even an attempt made four years ago, when we began to prepare an installation with which it would have been possible to conduct experimental projects on introduction of the method of pumping gas under high pressure. A project was begun, and dropped, which caused perplexity among petroleum scientists.

We must now discuss the notorious interdepartmental barrier. Petroleum specialists know that the latest scientific advance in our sector is the combined method, flooding that utilizes special muds. This is where we find almost 100-percent recovery, that is, forcing the petroleum out of the stratum! Yet the three ministries, the USSR ministries of Petroleum Industry, Chemical Industry, and Petroleum Refining and Petrochemical Industry, have not yet found an acceptable solution to the problem that has arisen. But the problem can be solved. This is illustrated by the fact that the collective of our institute developed four micellar solutions and received author's certificates [patents] for two of them this year. We have now completed work on a technological plan for testing these special solutions at the Kum-Dag deposit. The test will take two years. This time it will be possible to receive 20,000 additional tons of petroleum. It is easy to imagine how much greater the impact would be if this were the norm instead of an experiment. This is especially true because the new solutions are one-quarter to one-fifth of the price of existing micellar solutions.

There is one disturbing factor. During exploitation of oil wells paraffin is used. You cannot get along without it. But it also does a disservice; it is gradually deposited on the inner surface of the pump and compressor pipes and may "seal off" the well "from the bottom up," as they say. That is why scientists at the institute working together with production workers have developed a special solution which makes it possible to greatly reduce the intensity of paraffin deposits both in the stratum near the bottomhole and in the flow tubing in which the oil travels to the surface. This solution is made of waste products. It can be found in enormous quantities at the Bayram-Ali Butter and Fat Combine. But waste products are shipped only in large batches by railroad. Needless to say this is at the customer's expense. In reply to all our entreaties the managers of the combine simply say no, it cannot be shipped in tank-trucks. But in the stage when the solution is being used under experimental conditions we do not need more. Then when it goes into "series production," it will be possible to ship these waste products by railroad. No one will object.

But at the present time the work is not moving forward because of the narrow-minded position of the Bayram Ali people. This approach to work, obviously not a state-minded approach, results in the loss of valuable raw material.

The November 1982 Plenum of the CPSU Central Committee particularly stressed the role of science and progressive know-how in solving key national economic problems of the five-year plan. We can understand, therefore, how important it is to introduce scientific developments into production quickly. In this respect the Turkmenneft' Association faces a great deal of work. I do not want to be a pessimist, but facts are stubborn things. Many people will be surprised that such a comparatively large subdivision does not have a special department working on testing, incorporation, and introduction of new methods of increasing the yield of petroleum strata. I am not revealing anything new. I simply emphasize that the USSR Ministry of Petroleum Industry has already been able to set up two science-production associations, Soyuztermneft' [USSR Thermal Petroleum] in Krasnodar and Soyuzneftepromkhim [USSR Petroleum Industry Chemical] in Kazan.

Therefore, we have grounds to say that TurkmenNIPIneft' must, based on the laboratory of new methods of raising petroleum yield, organize a science-production subdivision of Soyuzneftepromkhim and assign it the duty of incorporating and broadly introducing the results of the latest research and development in petroleum extraction. There should also be a qualified review of the character, state, and direction of work on intensification of petroleum extraction. It will be necessary to expand studies of things such as water preparation, maintenance of formation pressure, bottom hole zone treatment, raising petroleum yield by flooding, and many others. All of these questions are closely interrelated. They must be solved in a purposeful and comprehensive manner, which is unfortunately not the case at present.

Summarizing what has been said you cannot help concluding that the republic Gosplan is not monitoring solutions to the problems of raising petroleum yield. Possibly a coordinating council should be set up under the Turkmen SSR Gosplan and a comprehensive scientific-technical program on this problem should be ratified.

Eliminating the obstacles to introduction of new, more effective methods of working the petroleum strata will promote an increase in the extraction of valuable fuel and raw materials and make it possible to successfully meet the challenges set down by the 26th CPSU Congress.

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## OIL AND GAS

### GAS SYSTEM MAINTENANCE IMPROVEMENTS TESTED IN LITHUANIA

Vilnius SOVETSKAYA LITVA in Russian 25 Mar 83 p 2

[Article by I. Sharkauskas, deputy chairman of the Lithuanian SSR State Committee for Gas Services: "The Lithuanian SSR State Committee for Gas Services Answers SOVETSKAYA LITVA"]

[Text] Annual technical servicing of indoor gas equipment has been done since 1970 in order to improve the safety of gas supply to the population. At the present time 880,000 apartments in the republic have gas hookups. Gas service workers do a large and very important job in supplying gas to the population safely and improving the technical maintenance of gas equipment in the apartments. The question raised in the comment entitled "Involuntary Absenteeism" in SOVETSKAYA LITVA on 25 January 1983 puts challenges before gas service workers which gas service organizations have been working on for several years already. At the same time these challenges concern insuring continuity of gas supply, the correct operating condition of gas equipment, and the airtightness of indoor gas lines; they also relate to modifying the existing system of servicing this equipment and the gas lines in homes so that we can minimize lost work time for the population (in order to give gas service workers access to home gas appliances).

Experiments on introduction of a new system for technical servicing of gas appliances and lines in homes in the cities of Vilnius and Kaunas (a total of 50,000 apartments) have been underway since 1979. Specialists from scientific institutions and gas organizations not just from our republic, but also from other republics are working on these questions today, taking into account current requirements, because the system of technical servicing of gas ranges and gas supply systems in residential buildings that has operated to the present time is the only one in the country. We are already managing to change the time schedule of servicing for appliances and gas lines and to increase the time between planned inspections from one to several years. We are helped in this by the use of new, up-to-date materials for servicing gas appliances and indoor gas supply systems, the introduction of sensitive instruments to identify gas leaks, guaranteeing the quality of servicing, and training the public so they can use gas safely.

Based on the experiments being conducted in Vilnius and Kaunas and on the experience of other gas service organizations the Lithuanian SSR State Committee for Gas Services is preparing appropriate proposals for submission to the republic government. They will cover introduction of a new system for servicing gas appliances and lines in residential buildings, beginning in the second half of this year. On 1 April 1983 testing the airtightness of indoor gas lines will already be done without the participation of the apartment dwellers and technical servicing of gas appliances will be possible without summoning the residents from work.



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pp 18-20 to change certain translation terms.

## COAL

### MORE HOUSING NEEDED AT KANSK-ACHINSK COMPLEX

Moscow EKONOMICHESKAYA GAZETA in Russian No 12, Mar 83 p 15

[Article by G. Starovатов, first secretary, Sharypovo Gorkom, CPSU: "Together Under Different Roofs"]

[Text] The young city of Sharypovo has become the staging base for the opening of the unique natural wealth of the Kansk-Achinsk basin. Its inhabitants are building the world's largest open pit mine at Berezovskiy, with an annual capacity of 55 million tons, and the Berezovskaya GRES-1, a 6,400 Megawatt plant.

Stripping work is under way at the Berezovskiy-1 Mine, the first parts of the Berezovskaya GRES-1 are being erected, and the first section of the airport has been put into operation. One after another, the shells of high-rise buildings loom above the city, and new schools, stores, kindergartens and nurseries are coming into use. Last year the collective of the experimental-industrial strip mine dispatched 43 percent more coal than in the year before.

Builders and installation workers have experienced great structural changes. The KATEKenergopromstroy [Kansk Achinsk Fuel and Energy Complex Power Engineering Construction] association has been created and two project trusts have been formed within it: KATEKenergostroy and KATEKgrazhdanstroy [KATEK Civil Engineering Construction]. It is important that the association included a number of construction enterprises located in the city of Nazarovo, as this has markedly increased its production potential.

KATEKstroy, the recently formed construction administration of BratskGESstroy, is gathering strength. It is entrusted with the construction of housing in the city. The Vostokenenergomontazh [Eastern Energy Installation] and KrasnoyarskGESstroy Trusts have become administrations. New subdivisions have arisen within the KATEKuglestroy [KATEK Coal Construction] Combine. A production supervision department of Glavkrasnoyarskprommontazh [Main Krasnoyarsk Industrial Installation] has been formed in the settlement of Dubinino.

All this has helped strengthen work collectives and improve the economic and management mechanism.

At the same time, one cannot shut one's eyes in face of serious difficulties, a large number of unsolved and at times very difficult problems of the young city. The main trouble is that there is still not an appropriate base for construction. It is sufficient to note that the daily capacity for the delivery of commercial concrete is only 300 cubic meters at the KATEKenergopromstroy Association, and 100 at KATEKuglestroy. Not a single construction and installation organization has a heated shop; a large part of the equipment is stored and serviced under the open sky. Due to a housing shortage it is impossible to attract and house the essential number of workers. So far only 110,000 square meters of housing have been built, compared to the target of 300,000. The construction of preschool facilities and other service and cultural projects is lagging. The decision to build 150,000 square meters of housing in the city has not been supported by deliveries of prefabricated ferroconcrete structures. The utilities system is not ready for such an amount of housing.

In this regard it would be good to recall that the unconditional fulfillment of the 11th Five-Year Plan target for the construction of housing and cultural-service facilities is a very important task, of great social and political significance in light of the decisions of the 26th CPSU Congress and the November 1982 CPSU Central Committee Plenum. This was especially stressed in the recent CPSU Central Committee Decree: "On Measures for Ensuring the Fulfillment of Plans for the Construction of Housing and Social-Service Projects".

The experience of other large projects in the nation has shown that rapid rates of work at a new site can be ensured only by strong, well developed builders' collectives with a powerful construction industry base. This was the case, for example, when the BratskGESstroy Trust began work at Ust'-Il'msk and Krasnoyarsk-GESstroy at Sayansk. In our view, the USSR Ministry of Power and Electrification made a serious mistake in entrusting the construction of KATEK facilities to the newly created Glavenergostroy, now the Soyuzenergostroy Association, which did not, and still does not have the necessary construction industry base in Siberia. In addition, having concentrated its main attention upon the construction of the GRES at Ekibastuz, the main administration could not allocate everything necessary to KATEK. The KATEKenergostroy Trust, which was created at a practically bare site in Sharypovo, not receiving the essential support and help from the Central directorate (glavka), was naturally not able to guarantee the given volumes of construction-installation work. What is more, from the very first the trust's management allowed a fragmentation of efforts and resources. The construction of the Sharypovo plant for large panel house building, so essential to the city, was stretched out for more than three years.

BratskGESstroy's appearance (true, after a three year delay) on the Sharypovo site straightened out the situation to a certain degree. In a short time the Bratsk workers introduced more than 30,000 square meters of modern, 9 story housing. However, something strange is happening. KATEKstroy is entrusted with projects in the city and the KATEKgrazhdanstroy of KATEKenergopromstroy has approximately the same tasks. But there is no talk of any kind of cooperation between these organizations being conducted by the managers. They belong to different main administrations.

The first organization receives everything necessary for construction from Bratsk, since it has no base in Sharypovo. The second has a base -- a concrete plant, a construction yard, and shops -- but still depends to a great extent

on the deliveries of prefabricated ferroconcrete which it obtains from Nazarovo in Kemerovo Oblast and from Ekibastuz. Therefore both are engaged in the creation of a production base, but their own, not a common one.

This is clearly unadvisable from an economic and production perspective. It would be good if USSR Minenergo [Ministry of Power and Electrification] would bring the necessary order into this operation and take all measures to sharply increase the rates of residential construction. This would be a guarantee of success in the solution of the main problems.

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## COAL

### KANSK-ACHINSK PROGRESS SURVEYED

Moscow SEL'SKAYA ZHIZN' in Russian 26 Jan 83 p 1

[Article by P. Zinkev, correspondent: "The Mighty Seams of KATEK"]

[Text] The fast company train, with the revealing name of KATEK [Kansk-Achinsk Fuel and Energy Complex], which has only recently started operating on the Krasnoyarsk Railroad, rushed us overnight from the Kray's center on the Yenisey to the Sharypovo Station. Formerly, 2-3 passengers got off here, an unremarkable place, looking like dozens of other backwoods small stations, which had previously been a two minute stop. This time everybody got off, and the small area near the station was immediately filled with the sound of voices in many languages. This is not surprising, for here, at Sharypovo, a mighty project is in full swing and gathering strength.

Here, KATEK extends for almost one hundred kilometers along the Trans-Siberian Main Line. The seams lie close to the surface and will be worked by standard strip-mining methods.

Naturally, only highly productive technology is capable of digging up such a mighty seam. At the miners' disposal are rotary excavators each with a productivity of 5,250 cubic meters of coal per hour, walking, and other excavators. They are now arriving at KATEK from outside the kray. However, near Krasnoyarsk, the gigantic Krastyazhmash [Krasnoyarsk Heavy Machinery] Plant, now under construction and already putting capacity into use, is to supply this type of equipment to KATEK.

However, KATEK isn't just a "chunk of coal" to be extracted, loaded into lines of freight cars and sent to various customers. Coal is KATEK's initial raw material. This appears in the very name itself: fuel and energy complex. There is a very simple, although not completely economical way of converting coal to energy -- burning it in boiler furnaces. KATEK has not rejected this process, but is not using it as its only weapon. Scientists' research has shown, that in addition to its conversion to thermal and electrical energy, it is also advisable to convert KATEK coal to liquid fuel through a catalytic hydrogenation process. It has been established that 5 tons of Kansk-Achinsk brown coal can produce 1 ton of liquid products. According to preliminary studies, by 1990 a ton of liquid fuel from Kansk-Achinsk coal will be 25-30 percent cheaper than fuel refined from petroleum extracted from remote Siberian regions.

Such are KATEK's parameters and essentials. Today it is a huge young project, which began at the old Siberian village of Sharypovo. A little more than a year ago it was transformed into a city. It is being built on an expansive scale, following a general plan, in a comprehensive manner, and meeting contemporary requirements.

KATEK is developing in three main directions: The introduction of coal capacity, the first section of which is the Berezhovskiy-1 strip, capable of 55 million tons annually; power production -- the Berezhovskaya GRES-1, equal to the Sayano-Shushenskaya GES; and the building of a new city. It is doubtful if any one of them is being given preference.

Perhaps anybody who becomes acquainted with the program for developing the mighty seams at KATEK will ask the natural question: How will the fuel and energy giant's "breathing" affect the surrounding environment? The solution to this vitally important problem lies in the very technology for the extraction, and especially for the processing of the fuel. Scientists at the Siberian Department of the USSR Academy of Sciences made a scientifically based ecological forecast of KATEK and its environmental protective measures. One of the main directions is to not only preserve, but to multiply KATEK's agro-industrial potential. Therefore even now, at the first stages of its construction, top priority is given to the restoration and recultivation of land. The scales are great. Just the first section of the Berezhovskiy-1 strip will require the removal of the vegetative and soil cover from 1,250 hectares. In all, this strip mine will occupy 7,100 hectares of agricultural land. After and parallel to this first section, an even larger series of Berezhovskiy strip mines and then the Uryupskiye mines will be developed. However, even in the process of coal extraction the land should bloom anew.

It is obviously essential to exert maximum efforts to see that this already established rule be strictly adhered to here, at KATEK, from the first days of its development.

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## COAL

### CONSTRUCTION AT KANSK-ACHINSK COMPLEX EXAMINED

Moscow STROITEL'NAYA GAZETA in Russian 15 Dec 82 p 2

[Article by N. Kurenkov, instructor, Krasnoyarsk Kraykom, CPSU: "Three Measurements of KATEK"]

[Text] Newspaper readers have become familiar with the abbreviation KATEK [Kansk-Achinsk Fuel and Energy Complex]. Its development scales are grandiose. Twenty industrial and cultural-service projects have been built and put into operation. These include the first section of the Itatskaya substation, two schools, a youth center, cafe, an asphalt plant, and other projects. The city of Sharypovo and the settlement of Dubinino are growing. Collectives from about 50 construction installation, transportation and other units of ministries and departments are working on KATEK projects.

However, there is still cause for concern about the introduction of the basic projects at the complex.

The construction of the Berezovskaya GRES-1, the first unit at KATEK, began on an empty field a considerable distance from the Kray's industrial regions. Naturally, the appropriate construction base had not been created here. Railroad, road, and other communications were weakly developed. There was an acute shortage of housing and social, cultural, and service facilities. These three problems were closely linked with one another and it is simply unthinkable to solve them in isolation. A comprehensive approach is needed, with constant interdependence between the development of bases, transportation and social infrastructure. This is what will be discussed.

Housing and social, cultural, and service facilities: Since the beginning of construction only 152,000 square meters of housing have been introduced in Sharypovo and Dubinino, while the plan calls for 280,000. This year things are going even worse. The 10 month program was only half fulfilled. The builders' work is unsatisfactory, above all this is due to the unplanned reorganization of subdivisions carried out this May by Glavenergostroy [Main Administration for Energy Construction]. For example, the Katekenergostroy Trust was broken up, and the newly created Katenergopromstroy Association has still not been formed, although a USSR Minenergo order provides that this be done within a month.

The construction administration of Bratskgesstroy [Bratsk GES Construction] which is involved in this work has not handled the tasks in the introduction of housing. It has not delivered a single meter of the 40,000 square meter annual target.

At the beginning of the year it was decided to send to KATEK 200 finishing workers from Glavenergostroy, Glavtsentrenergostroy and other units of USSR Minenergo. However, this decision has still not been implemented.

There are more than enough examples of irresponsibility, disorganization, and red tape. For three years workers from the Kul'tbytstroy Plant in Krasnoyarsk have been "outfitting" House No 3 in Sharypovo. The ferroconcrete structures plant in Tom'-Usinsk and Glavkrasnoyarskstroy [Main Krasnoyarsk Construction Administration] are violating delivery schedules to this project.

Because of the shortsightedness of workers from Minenergo and Minugleprom [Ministry of the Coal Industry], over the past three years there have been delays in the introduction of more than 120,000 square meters of housing. Where there is no housing there is a shortage of qualified workers.

Transportation: The introduction of housing depends to a great extent upon the capacity of railroads and roads, since all materials must be hauled long distances to the construction site, where there is nothing.

In order to build railroad track and a station, the Krasnoyarsktranstroy Trust created two new units at the Berezovskaya site: SMP-268 and SMP-654, while the Krasnoyarsk administration for road construction and operation created a special DSU [Road construction administration]. Quite a lot of time has passed since the creation of these units, and nothing has been done. At the Berezovskaya site alone more than 100 kilometers of railroad siding must be laid, but so far only 13 kilometers have been completed. Road builders and communications workers are doing no better. Without transportation and communications it will be impossible to complete the jobs at hand. As the work volume increases, the amount of freight transportation constantly grows, and even now it has reached more than 5,000 tons daily. Just one boiler unit at the Berezovskaya GRES-1 requires the transportation of more than 20,000 tons. Daily unloadings should exceed 150 freight cars, of which a good half is homebuilding parts. It is essential to prepare the site for unloading equipment and parts, and to ensure their protection.

A general plan for the development of the complex covered the construction of the projects. It had been planned to build about 50 projects involving railroads, motor vehicle transportation, and communications. In the past three years the general contractors and clients -- USSR Minenergo, USSR Ministry of Communications, USSR Ministry of Transport Construction, and the RSFSR Ministry of Highways -- have mainly been "shaking down" questions of financing, planning, and designing; they have really only begun work on a dozen projects. The repeated requests of party and soviet organs to the appropriate ministries to accelerate utilities installation work rates and volume have not had the desired effect. One cannot say that institutions in the capital have not reacted to our requests, however, no substantial measures are being taken. Every day up to 100 loaded freight cars sit idle in excess of norms due to the undeveloped transport system. In addition, there are gross violations of norms during car unloading.

Construction industry base. As has already been said, KATEK builders do not have the appropriate production base. All materials and equipment are hauled in from other oblasts and republics. Planning organs have allowed obvious mistakes in the creation of a base. Naturally, work here is also very slow.

The introduction of the first section of the large panel home building plant was planned for 1982. However, this deadline turned out to be unrealistic, the construction - installation plan was not being fulfilled.

According to Minenergo's plan, the commercial concrete plant in Sharypovo should have gone into operation back in 1981. The introduction deadline was violated. It would seem that the ministry would take all measures to introduce it at least in the first quarter of 1982, however, such measures were not taken. None of the projects have enough concrete or mortar.

There are also grounds for concern about the installation of enterprises for the production of nonmetallic materials. According to Krasnoyarsk Promstroyniiprojekt [Industrial Construction and Design Scientific Research Institute] 1982 gravel requirements were 880,000 cubic meters. The Nazarovo gravel crushing and sorting plant only produced half of its 700,000 cubic meter planned capacity. It is impossible to haul in gravel from other oblasts. The reason is obvious: low railroad capacity.

In 2-3 years these problems will become even more acute. The construction of KATEK projects requires two million cubic meters of gravel. There is nowhere to get it. In order to introduce additional capacity by the end of the five-year plan it has long been time for Minenergo to begin the reconstruction of the Nazarovo gravel plant, the gravel quarry at the Ozhinskoye deposit and the building stone quarry in Sharypovskiy Rayon. It not yet too late to begin this work if it is undertaken energetically. Gravel production using open air equipment should be organized at the overburden rock dumps of the Kiyashaltyskiy mine and the Sorskiy molybdenum combine. It is also necessary to set up a sand quarry with a washing facility at the Vladimirovskoye deposit in Nazarovskiy Rayon. All this would eliminate the acute shortage of inert materials.

The lack of a housing construction base has other unfortunate consequences: the first microregion of Sharypovo has housing which is undeveloped from an architectural point of view and is unsatisfactorily planned.

Capacity is growing slowly at the Nazarovo ferroconcrete structure plant, upon which very great hopes have been placed. It was planned to use this expanded capacity to produce parts for houses of new, progressive series. However, Nazarovo and Sharypovo have failed to receive more than 50,000 cubic meters of precast ferroconcrete. Last year capacity for the production of 67,000 cubic meters should have been introduced, but only half was delivered.

At the beginning of June the Sharypovo party gorkom, deputy minister of power and electrification V. Kozhevnikov, and deputy minister of the coal industry V. Belyy discussed the prospects for the KATEK project. The gorkom and gorispolkom reasonably posed the problems of creating a really nice, complete city of power production and coal workers, worthy of becoming the administrative center of the entire complex.

However, the meeting did not find a way of liquidating the lagging which has been allowed in residential construction and the creation of a production base. In fact, the lagging is increasing yearly. The problem, obviously, is that nobody is personally responsible for violations of plans.



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## COAL

### KATEK CONSTRUCTION PROGRESS REPORT

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 13 Feb 83 p 2

[Article by S. Sadoshenko, special correspondent: "The Coal Bin of the Nation"]

[Text] On a bleak day in September 1947 excavator operators N. Korbakov, I. Kurenkov and S. Pavlov moved the first buckets of ground at the site of the future Borodinskiy coal strip mine in the Siberian village of Borodino. True, they didn't know that they had thus begun coal extraction at one of the planet's richest deposits, the name of which is KATEK [Kansk-Achinsk Fuel and Energy Complex]. This deposit, stretching for 600 kilometers from Kemerovo to Irkutsk Oblast through the center of Krasnoyarskiy Kray, concentrates, at a shallow depth, more than 600 billion tons of brown coal, of which 140 billion tons are accessible by the low cost strip mine method.

The 11th Five-Year Plan is an important step in the development of the complex: preparatory work is being completed and we are beginning to dig out coal from the nation's bin. So far only a little has been done. During this five-year plan the growth in coal extraction capacity at KATEK is only 21 million tons. This is one-third of the sector's growth, but is at the same time quite modest when one considers the basin's total reserves. However, the decisive step has been made, the door to the bin is opening wider and wider.

When I first saw the world's largest walking excavator, the ESh-100/100 (it is simple to decipher: a 100 meter long boom and a 100 cubic meter bucket), it seemed unbelievable. This excavator is now working in KATEK's western section, stripping overburden rock at the Nazarovskiy mine.

It has now reached planned capacity, removing 13 million cubic meters of rock annually. It would seem that KATEK needs just such gigantic equipment. A dozen such excavators and all the coal is ours! However, specialists at the Berezovskiy-1 mine, the capacity of which is 55 million tons annually, have proposed another extraction system -- continuously operating equipment.

For a number of years a rotary excavator system with a productivity of 5,000 cubic meters per hour has been digging coal at the Borodinskiy mine, and a 5,250 cubic meter per hour excavator is being assembled at the Berezovskiy-1. This giant machine, build by the Zhdanovtyazhmash [Zhdanov Heavy Machinery] Association, has the serial number "1".

Delays in overburden stripping operations are the eternal misfortune of coal strip mines. KATEK coal is not deep, but all the same walking excavators will delay the movement of the rotary system. This is why it was decided to also use a rotary excavator for stripping operations with a productivity equal to the one engaged in coal extraction. Components for this machine are arriving at the assembly site of the Berezovskiy-1 mine.

I was able to see how a rotary machine operates. The 13.5 meter diameter rotor crunches through the seam. The operator of the self propelled loading system can direct the stream of coal to freight cars, and in 25-40 seconds a car is loaded. To an outside observer this capacity seems huge, but specialists are not satisfied. The Machine Building Plant imeni Leninist Komsomol of the Ukraine has already built a centrifugal rotor with a speed 3.5 times faster and weighing one-third less than the present gravity rotor. Series production of the innovation is beginning this year. What is more, work is under way on the creation of rotary systems with a productivity of 12,500 cubic meters per hour. These giants will be manufactured at the Krastyazhmash Association, which is beginning to produce the first units -- EKG-12.5 excavators.

Thus, KATEK will produce a lot of coal. The question arises as to how it will be transported. Different variants were examined and designers settled upon a conveyor system. This will include working face, main line, and transfer conveyors, and a 14.5 kilometer long double conveyor to the Berezovskiy-1 GRES No 1.

This would seem to be simple, but our nation has never produced conveyors such as these. The coal is to be carried by 1,600 - 2,000 millimeter wide belts. In order to make them the USSR Minneftkhimprom [Ministry of the Petroleum Refining and Petrochemical Industry] must construct a special plant, and the USSR Minchermet [Ministry of Ferrous Metallurgy] develop the production of a new item -- brass plated cables.

The impression is created that at the Kansk-Achinsk Complex, even the simplest problems, for which specialists have long had answer, must be solved anew, and at a higher level.

The Berezovskaya GRES-1 will introduce the nation's first 2,650 ton per hour steam generator using powdered coal. The boiler is 130 meters high and weighs 20,000 tons. Parts for this boiler unit are arriving at the installation site from the Machine Building Plant imeni Ordzhonikidze in Podol'sk.

"We intend to guarantee the introduction of the first block at the Berezovskaya No 1 in 1984, and in the first four years introduce a block a year, then organize the flow of work to introduce two blocks. By the middle of the 1990's another sequence of work will be organized and then we will annually be able to complete 4 blocks, each with a capacity of 800 Megawatts."

"During the current five-year plan we are building the Itat - Novokuznetsk -- Barnaul 1,150 kv line, and in the beginning of the 12th Five-Year Plan we will build it to Ekibastuz. Thus, the Ekibastuz GRES, KATEK, and the Siberian GES will be connected." This picture was drawn by P. Neporozhniy, minister of power and electrification, at a meeting of the coordinating council at the Krasnoyarsk Kraykom of the CPSU.

Yes, even during this five-year plan, a powerful flow of energy will come from KATEK. However, the Kansk-Achinsk's brown coal will not only produce electrical energy, but also synthetic liquid fuel. Of course, this is the long term, but confident steps are now being made on way way to energy technology enterprises using coal to produce mazut, motor fuel, and plastics. A new sector, coal chemistry, is being created before our eyes.

USSR Minenergo's State Energy Institute has developed a highly intensive method for the thermal breakdown of coal using a combined heat transfer agent and producing semicoke, tar, and combustible gases. This method has been tested in Kalinin and at the Sibelektrostal' Plant in Krasnoyarsk, where more than 80,000 tons of Kansk-Achinsk coal was processed. The main energy technology installation, the ETKh-175, with a productivity of 175 tons of coal per hour, is now being installed at the Kray center. It should be a prototype for future giants.

Refined solid fuel can be obtained from relatively low temperature processing of coal if the method proposed by the collective at USSR Minugleprom's Institute of Fossil Fuels is used. In order to develop this method a 100 ton per hour experimental autoclave is being built at the Borodinskiy mine.

A process is also being worked out to gasify coal in a fluidized bed with high temperature cleaning of the syngas obtained. This can be used to synthesize hydrocarbons, and analogues of some types of motor fuel. An experimental installation for making liquid fuel by the hydrogenation method is planned for the Berezovskiy-1 mine.

In short, science is attacking the synfuel problem on all fronts. It is already known that 4-5 tons of KATEK coal will produce 1 ton of synfuel. Its industrial production will begin in the 1990's.

Until recently hundreds of scientific collectives were engaged in each of the many problems, and they didn't attempt to examine them comprehensively. Perhaps there was previously no need for this. However, KATEK required the creation of its own scientific center, and last year it was organized. It is called the Scientific Research and Planning-Design Institute for Problems in the Development of the Kansk-Achinsk Coal Basin (KATEKNIUgol') and is part of USSR Minugleprom. The institute is already engaged in the entire complex of regional problems, from the development of the newest technology in strip mining, to the production of synthetic liquid fuel.

Every morning buses full of builders leave from the pioneer microregion, one of the three being built at the KATEK capital. One of them goes to the Berezovskaya GRES-1 construction site. Here the foundations for a 370 meter stack are ready, a reservoir dam and a boiler unit are being built. Another bus route goes to the installation site for the rotary excavator, and a third to the site of the future Berezovskiy-1 mine, where the preparation of strips is under way.

Builders come from the Ukraine, Moldavia, Lithuania, Latvia, Bashkiria, and Dagestan. Five shock detachments are working at KATEK, uncovering the wealth of this gigantic coal bin.

COAL

SYNOPSIS IN UGOL' UKRAINY , MAY 1983

Kiev UGOL' UKRAINY in Russian No 5, May 83 pp 47-48

FIRST OF MAY OF 11TH FIVE-YEAR PLAN

[Editorial. Coal industry of the Ukraine. Summaries, problems and obligations, pp 1-5]

UDC 622.232.72.031.2

ON THE PROBLEM OF CREATING HIGHLY EFFICIENT EXCAVATING EQUIPMENT FOR THE COMPLEX MINING GEOLOGICAL CONDITIONS OF THE DONBASS

[Synopsis of article by A. I. Parkhomenko, pp 6-8]

[Text] Difficulties originating in design of excavating equipment for complex mining geological conditions. Results of investigations and developments. Problems and proposals. 2 illustrations.

UDC 622.272.63: 622.013: 685.5

MECHANIZATION AND AUTOMATION OF PRODUCTION PROCESSES IN THE MAKEYEVUGOL' ASSOCIATION MINES

[Synopsis of article by Ya. Ya. Sukhan', A. I. Suslo, pp 9-10]

[Text] Changes in the plan for raising the technical standards and program of the "Energokompleks" for equipment in the mines of the Makeyevugol' Association. Results.

UDC 622.232: 658.387.4

KOMMISSAROV MINE. HIGH PRODUCTIVITY WORK OF THE GROZ BRIGADE

[Synopsis of article by V. V. Mulyk, pp 10-11]

[Text] Labor organization in the GROZ brigade. Technical economic indicators, achievements. 1 illustration.

UDC 622.01: 658.387: 658.5

YASINOVSKOYE MINE ADMINISTRATION. MORE THAN 500 TONS OF COAL PER DAY FROM THIN SEAM

[Synopsis of article by I. Y. Nazha, pp 12-14]

[Text] Successes of the No 7 section collective of the "Yasinovskaya-Glubokaya" mine of the Sovetugol' Association. Obligations. 1 table.

UDC 622.281.74

DAILY LOADING OF 800 TONS PER DAY FROM SEAM UP TO 1.2 METERS THICK

[Synopsis of article by A. G. Garkusha, pp 14-16]

[Text] Experience of GROZ brigade headed by I. M. Derun at the "Zhdanovskaya" mine. Loading at the longwall exceeds 800 tons per day, seam thickness 1 to 1.5 meters. Technical economic indicators, obligations. 2 illustrations.

UDC 622.268.13

NO. 9 VELIKOMOSTOVSKAYA MINE. EACH TUNNELING DAY IS A HIGH PRESSURE WORK DAY

[Synopsis of article by Ye. I. Ivanova, pp 16-17]

[Text] Work experience of V. G. Sokol's tunneling brigade in the No 9 "Velikomostovskaya" mine of the Ukrzapadugol' Association. 2 illustrations.

UDC 622.268.13 (477.61/62)

RAISING THE SPEED OF DRIVING DRIFTS

[Synopsis of article by S. K. Strizhiborda, V. D. Kovalev, V. P. Shirokikh, pp 19-19]

[Text] Necessary speeds of tunneling drifts for advanced preparation of sections with various facilities for excavation in the Central region of Donbass. Basic directions for reducing the labor intensity in the tunneling cycle process. 2 illustrations.

UDC 622.834: 622.262

PRINCIPLES OF GEOMECHANICAL LIQUIDATION OF PREPARATORY DRIFTS

[Synopsis of article by A. F. Borzhykh, A. N. Khudyakov, S. I. Onishchenko, pp 19-20]

[Text] Special behavior of rock in preparatory drifts when extracting the metal arch supports and the parameters that characterize this process. Determination of the height of the arch of rock roof cave-in and of residual loads of the supports being recovered. 1 table. 2 illustrations.

PROVIDING HIGH PRODUCTIVITY WORK IN MINE

[Synopsis of article by M. G. Sherser, pp 21-22]

[Text] Technical economic indicators at the imeni Kalinin mine of the Artemugol' Association. Ways to realize efficient solutions to increase the volume of mining and productivity of labor. 1 illustration.

UDC [658.562.64: 622.335]. 003.12

QUALITY CONTROL SYSTEM FOR ANTHRACITE

[Synopsis of article by V. I. Beznoshchenko, A. G. Tikhomirov, pp 23-24]

[Text] Rules of the proposed system for coal quality control and material incentive by reducing ash content and improving the grade of the anthracite.

UDC 622.625.28-83: 622.647.001.86

DEVELOPMENT OF UNDERGROUND TRANSPORT IN MINES OF THE CENTRAL REGION OF DONBASS

[Synopsis of article by V. S. Ovcharov, V. G. Rybin, p. 25]

[Text] Reasons for unsatisfactory operation of underground transport in the Central region of Donbass. Development prospects of electric locomotive and conveyor hauling for increasing loading at comprehensively mechanized longwalls.

UDC 62-59: 622.673.1

DEVICES FOR PREVENTING THE LIFTING VESSEL CLIMBING THE CABLE

[Synopsis of article by N. L. Belikov, V. N. Litvinov, L. G. Malomud, pp 26-27]

[Text] Design of two devices to control selective safety braking. Test results at the "Butovka-Donetskaya" mine. Recommendations. 4 illustrations.

UDC 622.647.23.001.5

OPERATING PARAMETERS OF TRACTION CHAINS OF SCRAPER CONVEYORS

[Synopsis of article by V. Ya. Sporykhin, V. M. Snovedskiy, pp 28-29]

[Text] Investigation of the reliability of scraper conveyor. Improvement in operating parameters of traction chains.

UDC 622.676

GUIDING SHOE OF MINE LIFTING VESSEL

[Synopsis of article by Ya. S. Gritsevskiy, G. N. Smetana, p 29]

[Text] Design of guiding shoes of mine lifting vessels that have shock absorbing devices in the form of alternating rubber and metal rings. 1 illustration.

UDC 621.316.37: 622.002.5.004.62

RELIABILITY OF EXPLOSION-PROOF KRUV-GKhL5 SETS OF DISTRIBUTION DEVICES

[Synopsis of article by B. N. Vaneyev, Yu. A. Shamro, A. A. Shirobokov, pp 29-30]

[Text] Results of operating tests of 38 KRUV-6KhL5 distribution device sets at Donbass mines. Analysis of failures. Measures for further increase in the reliability of the distribution devices. 1 table. 1 reference.

UDC 622.621.51

PRODUCTIVITY REGULATION OF COMPRESSOR STATIONS

[Synopsis of article by L. N. Arkhangel'skiy, pp 30-31]

[Text] Nature of changes in productivity and pressure of a compressor station with change in load at the end of the air line network. Necessity of equipping mine compressor stations with devices to regulate productivity. 2 illustrations.

UDC 622.413: 536.224

INVESTIGATION OF HEAT EMISSION INTENSITY WHEN COAL IS OXIDIZED

[Synopsis of article by M. G. Reznik, I. L. Zhislina, B. A. Spector, pp 31-33]

[Text] Effect of size of coal particle, temperature at start of oxidation, speed of oxygen movement, humidity of coal and oxygen on the intensity of heat emission when coal is oxidized at low temperatures. Empiric equations for heat calculations and developing measures to prevent spontaneous coal combustion. 1 table. 2 references.

UDC 622.43.45: 418.455

CLIMATIC CONDITIONS AND VENTILATION STATE IN NONGASEOUS DONBASS MINES

[Synopsis of article by M. A. Frolov, A. Ya. Potaturin, pp 33-34]

[Text] Results of investigations of climatic conditions and analysis of the

state of ventilation in operating nongaseous Donbass mines. The basic sources of increase in the heat of the ventilation jet along the path of its movement from the surface to the consumers. Recommendations.

UDC 622.868.42: 691.9

#### WATERPROOF GYPSUM MATERIAL FOR ERECTING FIRE STOPPING WALLS

[Synopsis of article by V. S. Konyuchenko, R. F. Snisarenko, pp 34-35]

[Text] Results of investigating the use of Kurakhovskaya GRES ash as a pozzuolanic additive to the gypsum-cement binder. The compositions of waterproof material using gypsum and tests of specimens from them under laboratory and mine conditions for eight years. 2 tables. 1 illustration.

UDC 622.01: 502

#### PERVOMAYSKUGOL' ASSOCIATION. ENVIRONMENT PROTECTION IN ITS ENTERPRISES

[Synopsis of article by P. A. Tishkov, pp 35-36]

[Text] Organizational and technical measures for environment protection in Pervomayskiy' Association enterprises. 1 table.

UDC 622.222.42.001.2

#### DESIGN OF VERTICAL MINE SHAFTS WHEN DEEPENING WITH ROCK OUTPUT TO EXISTING LEVEL

[Synopsis of article by Ye. M. Durov, pp 36-38]

[Text] Requirements for designing cross sections of central shafts for the determination of the productivity of the upgrade and equipment of the shafts when deepening them in the following technological arrangement with the delivery of the rock to the existing level. Typical cross sections of skip and latticed shafts. 3 illustrations.

UDC 622.256.7

#### SEQUENCES AND PITCH OF DEEPENING SHAFTS WHEN PREPARING NEW LEVELS

[Synopsis of article by L. A. Noskov, pp 39-40]

[Text] Possible variations of arrangements of opening coal seams in mines of the Central region of Donbass. Recommendations on the sequence of deepening vertical shafts taking into account the determination of the deepening pitch. 2 illustrations.



UDC 622.335.013: 658.64 (477.6)

CONTENT OF ASH AND LARGE-MEDIUM GRADES IN ANTHRACITE

[Synopsis of article by V. A. Aleksandrovich, A. A. Krivchenko, N. M. Yamko, pp 40-41]

[Text] Discrepancy between established and reported indicators of the fines content for anthracite mines and their actual content. The expediency of introducing a movable scale for the fines content that reflects the anthracite grade when its ash content changes. 1 table.

UDC 62-50: 622.333.002.62: 619.24: 634.31

EVALUATION OF THE DYNAMICS OF THE ASH CONTENT FORMATION PROCESS IN THE STOPE AND MINE

[Synopsis of article by G. L. Maydukov, V. M. Lobkin, pp 41.43]

[Text] Method for calculating the statistical evaluation of the ash content of mined coal. Program of calculating statistical evaluations by multifactor regressive models. 2 illustrations.

UDC 556.314: 622.5 (477.82/.83)

SPECIAL FEATURES OF THE HYDROCHEMISTRY OF THE L'VOV-VOLYNSK COAL BASIN DEPOSITS

[Synopsis of article by L. I. Rokhlin, V. Ya. Karavayev, pp 43-45]

[Text] Results of the chemical investigation of mine waters in the L'vov-Volynsk basin deposits. Waters of several mines are hydro-mineral raw material. 1 table.

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CSO: 1822/256

## NUCLEAR POWER

### STATE COMMITTEE ESTABLISHED TO OVERSEE NUCLEAR POWER SAFETY

LD190612 Moscow in English to North America 2200 GMT 18 Aug 83

[Excerpts] A recent decision here in the Soviet Union outlined additional measures to ensure safety at nuclear power stations and specifically to set up a state committee to supervise work safety in the nuclear power industry. What prompted this decision, have any doubts arisen concerning the technology that has now been reliably operating for a long time? Here is the opinion on this subject of our science correspondent Boris Belitskiy.

[Begin Belitskiy recording] Well, it's the prevailing opinion in this country that the real loss from nuclear power stems from its insufficient use. This is not a paradox. Nuclear power, it is believed in this country, is the main energy source that humanity can count on in the foreseeable future. No other candidates for powering the world economy are in sight at this stage.

In 1954 the Soviet Union put the world's first nuclear power station into operation. The many nuclear power stations that have followed in this country have provided no grounds for any environmental concern. But, by 1990, the generating capacity of such stations will be much greater than it is now. Naturally whatever has been accomplished in terms of safeguards up to now will have to be further upgraded. This requires considerable efforts and outlays. The safeguards installed at Soviet nuclear power stations--three and fourfold redundancy, water recycling and the like--even now swallow all but half the total cost of the stations. Nevertheless, there's no intention of economizing at the expense of safety.

The system of supervision in the Soviet Union, assuring a reliable performance of the nuclear power industry, consists of several stages but the growing scale of the industry naturally requires that this supervision be improved and centralized. That's the reason for organizing the new state committee and for the other additional measures concerning supervision and safety in the industry.

CSO: 1822/316

## PIPELINE CONSTRUCTION

### SUPERLONG PIPELINE LENGTHS MADE BY NEW METHODS

Moscow NEFTYANIK in Russian No 4, Apr 83 p 23

[Article by A. Trutnev: "New Pipe for Gas Pipelines"]

[Text] When laying pipelines thousands of kilometers long, a massive number of joints must be welded. A reduction of this number means a considerable acceleration of pipeline construction. The plants are now manufacturing pipe 6-12 meters long. A further increase in the length of pipes produced is marked by great technical difficulties. Soviet scientists' innovations consist of pipes as much as...a kilometer long, which were developed in the Institute of Electrical Welding imeni Paton.

The first design consists of flat coilable pipe that is manufactured and is transportable, like a fire hose. Two steel strips are laid down, one superimposed on the other, and they are passed through an automatic welding machine, which joins the edges. The welded strip, up to a kilometer in length is rolled up on a drum 25 centimeters wide and 2.5 meters in diameter (one weighs 7-10 tons) and is sent to the pipeline route. There the drum is set up on a machine which, in advancing along the ditch, lays the strip. Then air is injected into it, it is inflated, and it takes the shape of ordinary pipe.

Thanks to the thin walls (2 millimeters for pipe up to 300 mm in diameter), for the manufacture of flat coilable pipe, little more than half as much metal is required as for ordinary pipe. And it is also easy to transport in the form of a roll.

The second design is a spiral-seam pipe, manufactured to be similar to a small tubular confection made of layered dough. The thin steel strip is wound on a special forming device in the form of a multilayered spiral, in which the inner and outer seams are welded. Since these processes are continuous, the manufactured pipe can be of practically any length. Thanks to the large number of layers (there can be six, or even more), this pipe will sustain much higher pressure than ordinary pipe, and almost twice as much gas can be pumped along lines made of this pipe.

These pipes can be made of coil steel with minimal alloying, to yield a considerable saving of resources. The multilayer pipe has been tested successfully.

The first phase of a shop planned to produce 250,000 tons of pipe per year has been started up at a metallurgical plant in the city of Bysk, in Gorky Oblast.

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